Signature: © Pol J Radiol, 2014; 79: 352-355
DOI: 10.12659/PJR.890900

Polish Journal of Radiology
www.PolRadiol.com
CASE REPORT

Received: 2014.04.22
Accepted: 2014.05.05
Published: 2014.10.07

Superselective Arterial Embolization of Pseudoaneurysm and Arteriovenous Fistula Caused by Transurethral Resection of the Prostate

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Data Interpretation
E Manuscript Preparation
F Literature Search
G Funds Collection

Pinar Celtikci[EF], Onur Ergun[AE], Idil Gunes Tatar[AE], Isik Conkbayir[AF], Baki Hekimoglu[AE]

Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey

Author's address: Onur Ergun, Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey, e-mail: onurergun@yahoo.com

Summary

Background: Pelvic vascular lesions such as pseudoaneurysms and arteriovenous fistulas associated with the internal pudendal artery are uncommon. The most common cause is traumas including those of iatrogenic origin. Surgical treatment is complicated due to location of the lesions and endovascular approach is usually the first choice among the treatment options.

Case Report: A 79-year-old patient was admitted with massive hematuria following transurethral resection of prostate for benign prostatic hyperplasia. Doppler US and angiography revealed a pseudoaneurysm and arteriovenous fistula originating from the right internal pudendal artery. It was successfully treated with coil embolization.

Conclusions: Arteriovenous fistulas and pseudoaneurysms concerning internal pudendal artery may occur as complications of prostate operations. Minimally invasive endovascular methods provide safe and efficient treatment and today should be considered as the first line of choice.

MeSH Keywords: Embolization, Therapeutic • Hematuria • Intraoperative Complications • Transurethral Resection of Prostate

PDF file: http://www.polradiol.com/abstract/index/idArt/890900

Background

Pelvic vascular lesions such as pseudoaneurysms and arteriovenous fistulas (AVFs) associated with the internal pudendal artery are uncommon. The most common cause is traumas including those of iatrogenic origin [1,2]. Surgical treatment is complicated due to location of lesions and endovascular approach is usually the first choice among the treatment options [2,3]. We report a case of internal pudendal artery pseudoaneurysm and accompanying arteriovenous fistula secondary to transuretral resection of the prostate which was successfully treated by transarterial coil embolization.

Case Report

A 79-year-old male patient with a history of benign prostatic hyperplasia was admitted to urology outpatient clinic with globe vesicale. The patient was hospitalized for internal ureterotomy and transurethral resection of the prostate. One week after the operation, while the patient was still in hospital due to his other chronic conditions, he had gross hematuria. Diagnostic cystoscopy showed intravesical heamatoma. Penile color Doppler ultrasonography (CDUS) revealed high flow velocity in both cavernozal arteries and spongiosal artery with a pseudoaneurysm formation of 3×1.5 centimeters in size, adjacent to the right side of the penis root and urethra, approximately 3.5 centimeter deep in the perineum. Both of the cavernosal arteries were adjacent to the pseudoaneurysm. At the same day, following CDUS, the patient was referred to our interventional radiology unit for further investigation of the related arterial and venous structures with the defined pseudoaneurysm. Both internal iliac arteries were selectively catheterized. There were no abnormal findings after injection in the left internal iliac artery. Injection of the right internal iliac artery revealed a pseudoaneurysm approximately 2 centimeters in diameter with venous filling during the early arterial phase, located at the distal portion of the right internal pudendal artery suggesting AVF (Figure 1A, 1B). The right internal

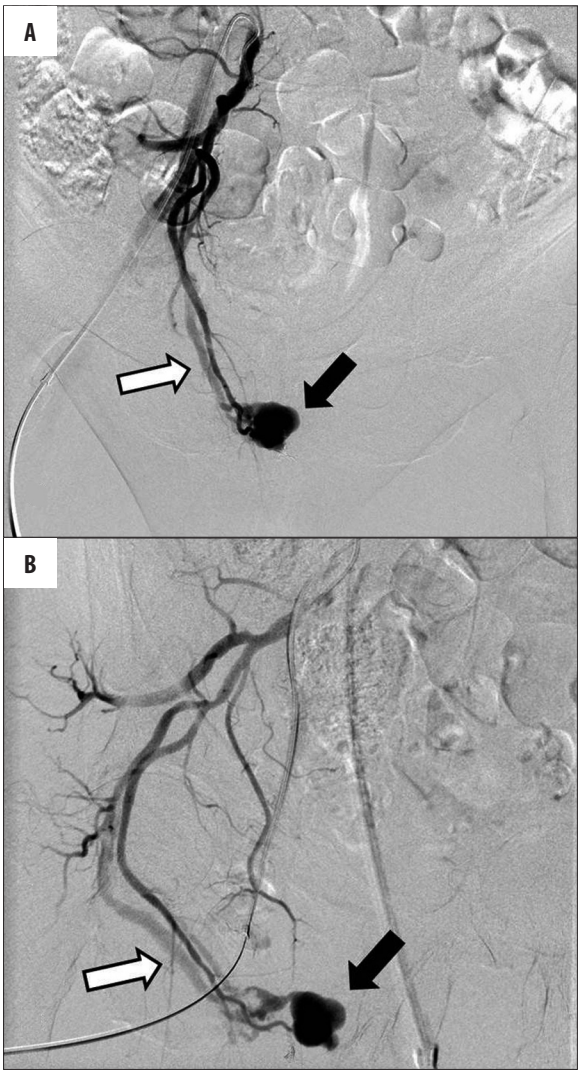

Figure 1. (**A, B**) Selective right internal iliac artery injection revealed a pseudoaneurysm (black arrows) accompanied by venous filling in the early arterial phase suggesting AVF (white arrows).

pudendal artery was catheterized superselectively with a 2.7 French microcatheter (Progreat Coaxial Microcatheter System®, Terumo Medical, Somerset, NJ, USA) (Figure 2) and the distal portion was embolized with multiple microcoils (Barricade Helical Fill Endovascular Embolization Coil®, Blockade Medical, Irvine, CA, USA) (Figure 3). Unfortunately, quite a long segment of the right internal pudendal artery had to be embolized due to continuation of pseudoaneurysm filling. A total number of eight microcoils (three 3×40 mm, three 4×60 mm and two 5×80 mm microcoils) were used for embolization. After embolization, control angiograms showed no evidence of pseudoaneurysm or arteriovenous fistula while the perineal blood flow remained sufficient (Figures 4 and 5). After the procedure, the patient had no hematuria.

Discussion

Pseudoaneurysms and AVFs emerge as a result of arterial wall damage. Pseudoaneurysm is a sac formation

Figure 2. Superselective right internal pudendal artery injection from microcatheter (black arrow) showed a pseudoaneurysm and AVF.

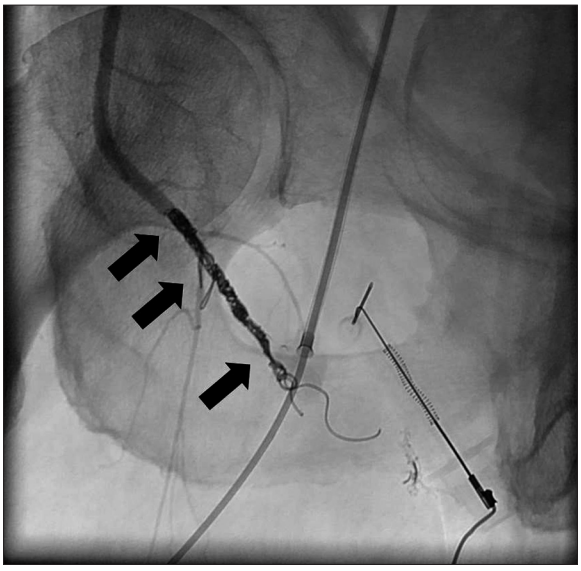

Figure 3. Distal portion of the right internal pudendal artery was embolized with multiple coils (black arrows).

communicating with the arterial lumen and confined by surrounding tissues whereas AVF is an abnormal connection between an arterial and venous structure [3]. Internal pudendal artery pseudoaneurysms and AVFs are rare cases and usually associated with abdominal trauma or surgical interventions [4,5].

Despite the fact that pseudoaneurysms may undergo spontaneous thrombosis, these vascular lesions require treatment if they become symptomatic [3,6]. In our case, concomitance of internal pudendal artery pseudoaneurysm and AVF with patient being symptomatic indicated definitive treatment of both lesions.

Treatment options for pseudoaneurysms include traditional surgical repair, US-guided compression, US-guided

Figure 4. A control angiogram of the right internal pudendal artery showed no evidence of pseudoaneurysm or AVF.

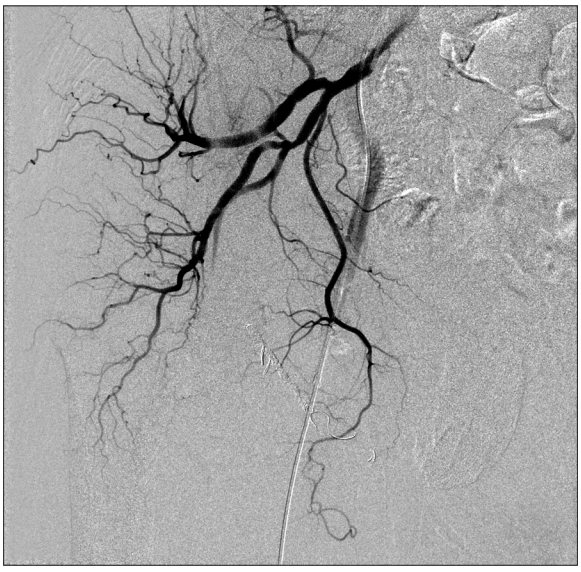

Figure 5. A control angiogram of the right internal iliac artery showed no evidence of pseudoaneurysm or AVF.

thrombin injection and endoluminal procedures such as coil embolization, covered stent placement, stent-assisted coil embolization and transcatheher application of cast-forming agents. Most of these treatments can also be applied for the treatment of AVFs [1,3,7]. Surgical repair has various complications such as anesthesia-related risks, bleeding, wound infection, lymphocele formation, radiculopathy and prolonged recovery time which made minimally invasive treatment options the first line of choice [8].

To our knowledge, in the literature, there are only two reported cases of internal pudendal artery pseudoaneurysm accompanying AVF following extraperitoneal laparoscopic radical prostatectomy presenting with late recurrent hematuria [9]. Both cases were treated by superselective coil embolization. Similarly, Beckley et al. treated delayed hemorrhage from an accessory internal pudendal artery pseudoaneurysm after robotic radical prostatectomy using microcoils following superselective catheterization [10]. In the literature, there are also other reports on post-operative bleeding following radical prostatectomy presenting with hemodynamic instability, treated successfully with other endovascular methods. Jeong et al. utilized enbucrilate: ethiodized poppy seed oil mixture for transarterial embolization due to postoperative bleeding after radical prostatectomy [11]. These reports confirmed that transarterial embolization is a minimally invasive and efficient way of managing post-operative bleeding due to prostate operations, preventing further surgical exploration which is associated with increased morbidity [10,11].

In our case, the patient had recurrent gross hematuria following transurethral resection of the prostate suggesting an arterial damage. Diagnosis was made using CDUS and catheter angiography. Concerning patient's age and presence of both pseudoaneurysm and AV fistula associated with internal pudendal artery, minimally invasive treatment methods were the first line of choice. Since the pseudoaneurysm was located deeply in the perineum, US-guided compression or thrombin injection was not suitable. The caliber of the affected portion of the artery was also inappropriate for stent-directed methods. The lesion was located at the distal portion of the internal pudendal artery which made coil embolization convenient. Thus, we achieved definitive treatment of both lesions using a minimally invasive method avoiding reoperation complications.

Conclusions

AVFs and pseudoaneurysms concerning internal pudendal artery may occur as complications of prostate operations. Minimally invasive endovascular methods provide safe and efficient treatment and today should be considered as the first line of choice.

References:

1. Jesinger RA, Thoreson AA, Lamba R: Abdominal and pelvic aneurysms and pseudoaneurysms: Imaging review with clinical, radiologic, and treatment correlation. Radiographics, 2013; 33: 71–96
2. Papadakos N, Wales L, Hayes K et al: Post-traumatic pelvic pseudoaneurysm and arterio-venous fistula: combined endovascular and surgical approach. Eur J Vasc Endovasc Surg, 2008; 36: 164–66
3. Saad NE, Saad WE, Davies MG et al: Pseudoaneurysms and the role of minimally invasive techniques in their management. Radiographics, 2005; 1: 173–89
4. Wiedeman J, Mills J, Robison J: Special problems after iatrogenic vascular injuries. Surg Gynecol Obstet, 1988; 166: 323–26
5. Landereneau RJ, Synder WH III: Pelvic abcess or pseudoaneurysm: Diagnostic and therapeutic dilemma following iliac arterial trauma. Am J Surg, 1992; 163: 197–201
6. Soudack M, Epelman M, Gaitini D: Spontaneous thrombosis of hepatic posttraumatic pseudoaneurysms: Sonographic and computed tomographic features. J Ultrasound Med, 2003; 22: 99–103
7. Gujral S, MacDonagh RP, Cavanagh PM: Bilateral superselective arterial microcoil embolisation in delayed post-traumatic high flow priapism. Postgrad Med J, 2001; 77: 193–94
8. La Perna L, Olin JW, Goines D et al: Ultrasound-guided thrombin injection for the treatment of postcatheterization pseudoaneurysms. Circulation, 2000; 102: 2391–95

9. Lopes RI, Mitre AI, Rocha FT et al: Case report: Late recurrent hematuria following laparoscopic radical prostatectomy may predict internal pudendal artery pseudoaneurysm and arteriovenous fistula. J Endourol, 2009; 23: 297–99
10. Beckley I, Patterson B, Hamaday M et al: Case report: delayed hemorrhage from an accessory internal pudendal artery pseudoaneurysm after robotic radical prostatectomy: successful management with ct angiography and embolization. J Endourol, 2007; 21: 923–25
11. Jeong CW, Park YH, Ku JH et al: Minimally invasive management of postoperative bleeding after radical prostatectomy: transarterial embolization. J Endourol, 2010; 24: 1529–33